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Empirical Analysis of Corporate Savings in Egypt

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Abstract

This paper presents empirical analysis of corporate savings in Egypt using two datasets: a survey of small and medium enterprises and data from accounting statements for the largest publicly traded firms. There are two main findings. First, larger firms invest more (they have more physical saving) and have greater access to finance than smaller firms. Second, despite the financial deepening, the use of credit products has been declining during the past decade. The study reaffirms the importance of improving access to financial services in Egypt and points out the need for more research. In addition, policies aimed at reducing macroeconomic volatility are likely to result in increased investment and growth in Egypt.

This paper is a product of the Finance and Private Sector Development Team, Development Research Group. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org.
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Empirical Analysis of Corporate Savings in Egypt

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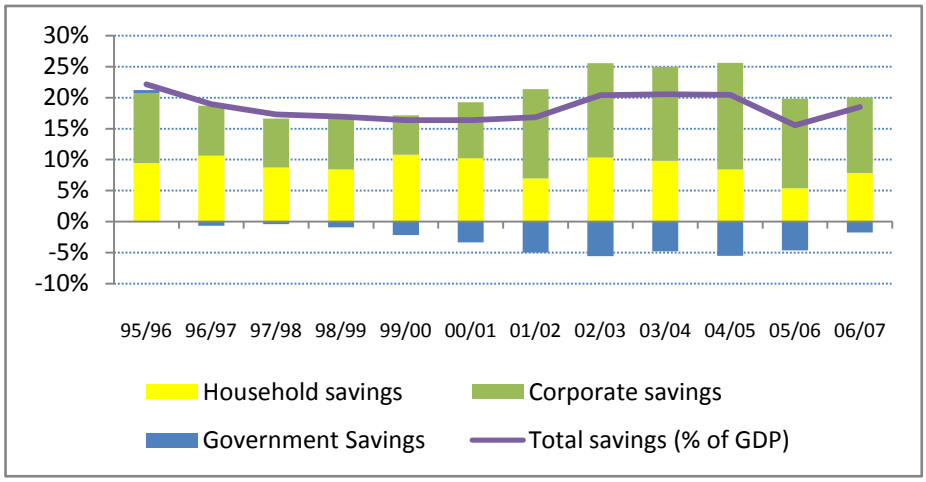
1. Introduction

Corporate savings is an important component of the overall savings in Egypt, representing about 50% of total savings (Figure 1). It is important to understand why companies in Egypt save so much, what types of companies are most likely to save, and how financial savings interact with firm real decisions on investment into productive assets and with external finance constraints. This analysis may suggest more effective policies to support higher growth and development in Egypt. This paper uses two datasets - Investment Climate Assessment and data for publicly listed firms on EGX to analyze the determinants of corporate savings behavior.

Figure 1. Composition of Savings in Egypt



Source: WB Staff calculations based on National Accounts

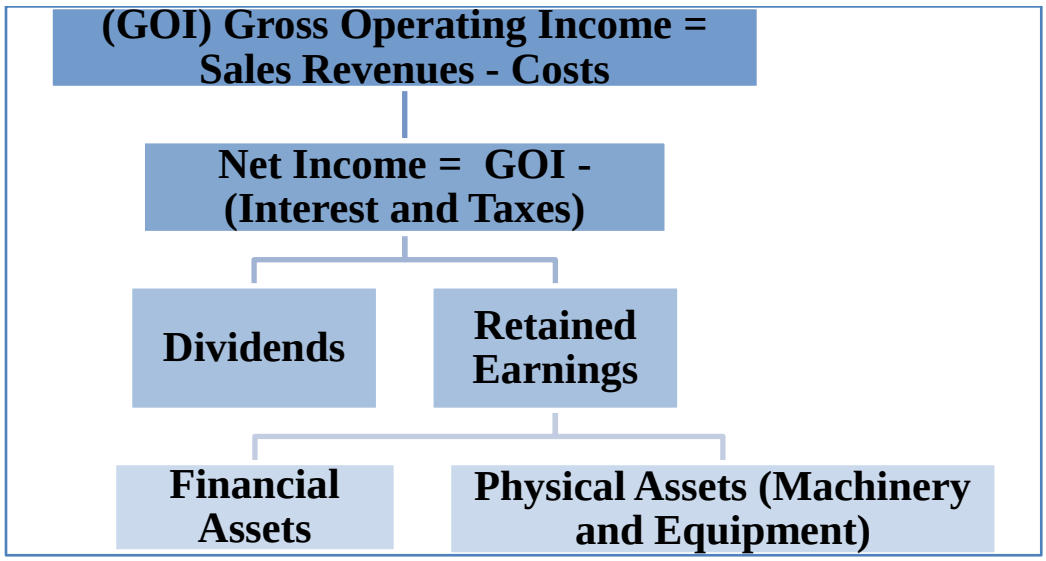
2. Defining Corporate Savings

Figure 2 presents a rough outline of the flow of funds in firms, which is helpful in defining corporate savings measures. Sales revenues minus costs comprise gross operating income (GOI), which is a very crude proxy for the cash flow available to firms. Out of the GOI the firm must pay interest on loans and taxes (and perhaps subtract other expenses not included in the GOI cost calculations). Then we arrive at the net income, which is a proxy for cash flows available to firms.[1] The net income can be either paid to firm equity holders as a dividend distribution or retained in the firm in the form of retained earnings. In turn, retained earnings can be allocated to

[1] Depreciation of existing assets is considered a non cash expense. It usually is added back to net income for purposes of cash flow calculations. Changes in working capital can also be taken into account for cash flow calculation.

physical assets - to expand the business via investment into machinery and equipment or expanding the working capital or as an addition to financial assets, e.g. as cash held in the bank or other short-term liquid assets (government paper, etc). In accounting terms, as retained earnings add to the equity balance (reflected in the equity and liability side of the balance sheet), the asset side of the balance sheet has to accommodate the increase by increasing liquid assets, working capital or fixed assets.

Figure 2. Flow of Funds Diagram



Using the diagram above, we can define two components of corporate savings that parallel aggregate savings definition. The first component represents addition to physical assets as investment in property, plant and equipment. We refer to this component as **Physical Savings**. The second component represents addition to financial assets, as increase in the firm's holdings of cash and marketable securities. We refer to this component as **Financial Savings**. It is a portion of retained earnings that is not spent on expanding the business. The investment in working capital can be considered as a third component of savings, but it is likely to have a smaller order of importance in firm's decision making process.

In this paper we focus on two measures of savings – Financial Savings and Physical Savings. Together they comprise the total corporate savings.

3. Why Do Firms Save?

Firms are created to produce goods or services, in other words to transform a number of inputs into specific outputs using some production technology. Firms with good growth potential will make investments in machinery, equipment and working capital to expand the business and capture this growth potential. Investment in productive assets is one of the key elements necessary to support higher growth.

Most firms prefer to use internal funds when they are available, and only raising external finance in the form of debt and equity if they lack sufficient internal funds. This empirically observed pattern is known as the pecking order theory (Mayers and Majluf, 1984). The reason for this pattern is asymmetric information – firms and their managers know more about the true quality of the project than outside investors (such as bank or stock holders) and therefore the cost of internal finance will be lower than the cost of outside finance. According to the pecking order theory, when firms choose to access external funds, they first turn to debt and next to equity.

The investment projects tend to be lumpy (i.e. one cannot buy a half of machinery one year and another half the next year) and thus require large financial outlays. It may take a firm many years to accumulate sufficient internal funds to purchase necessary piece of equipment, and meanwhile the growth opportunity may have evaporated, as another company may have taken it. Therefore access to external finance is essential for growth as it allows companies with good growth projects to make timely investments into physical assets and take maximum advantage of growth opportunities. Financial system plays an important role in reallocating consumer savings to firms with productive investment opportunities and support efficient reallocation of capital in the economy (Levine, 1997; Love, 2003). Without access to finance firms have to accumulate financial savings before they can make any investment into physical assets.

Firms' financial decisions, such as whether or not to pay dividends or to keep the earnings in the firm (i.e. retained earnings) depend on the current and expected future growth opportunities. Since investment is lumpy and growth opportunities may occur unexpectedly, firms may find it optimal to accumulate large precautionary cash balances (i.e. allocate their savings toward financial assets). This incentive to save will be stronger for firms that have less

access or higher costs of external finance. These savings are kept in liquid accounts instead of being invested into productive assets or being distributed to shareholders.

Riddick and Whited (2009) develop a dynamic model of savings and find that firms save more when they have higher income uncertainty (because of higher income volatility) or more binding external finance constraints. The firm's optimal savings policy will also depend on the firm's expected future financing needs. In the environment of higher uncertainty it is more difficult for firms to estimate their financing needs, which may prompt them to hold higher cash balances and make more savings. Similarly, in an environment with high costs of external finance the firms can benefit from a large stock of internal cash which will allow them to make investments when the opportunities arise. In this model firms also hold more cash if their investment is lumpier. Some industries inherently have more lumpy investment than others (e.g., hotels).

It is plausible that firms producing the most cash flows will be the ones that can save the most. However, the allocation of savings between financial savings and physical savings (i.e. investment) will depend on the several factors. For example, if a firm is facing a positive productivity shock, its cash flow will raise. This increase signals that this firm has a good investment opportunity and need to expand the business. Therefore, the firm will make an investment into physical assets using the available cash flow. As a result the firms will have less cash to put away as financial savings in the year they make a large investment. Thus, savings in physical assets and financial assets will be negatively correlated contemporaneously. However, over time, increase in financial assets is likely to lead to increase in investment in physical assets in the future.

The trend in the US and other developed countries over the past two decades has been toward an increasing share of liquid assets. In other words, companies around the world have been making more savings recently than in the past.[2]

[2] Bates, Thomas W., Kahle, Kathleen M. and Stulz, Rene M., Why Do U.S. Firms Hold so Much More Cash than They Used to? (April 2008). Fisher College of Business Working Paper No. 2007-03-006; Charles A. Dice Center Working Paper No. 2006-17. Available at SSRN: http://ssrn.com/abstract=927962

4. Data

This paper uses data from two sources to analyze the behavior of corporate savings in Egypt: the ICA (Investment Climate Assessment data collected by the World Bank) and data for listed firms.

To create our listed firms datasets we use the data on the 50 largest companies listed on EGX (Egyptian Stock Exchange).[3] We excluded 14 companies that are classified as banks or financial holding companies as their savings have different meaning from those of industrial companies. We are left with a small sample of 36 companies with balance sheet and income statement data available from 2001-2008.

Each of the two datasets has its own advantages and disadvantages discussed below.

ICA data:

- Advantages:
  - Data are available for over 1000 small, medium and large firms.
  - There are 3 waves of survey (2003, 2005, 2007).
  - It contains rich data on firm characteristics and access to external finance.
  - There is exact data on investment into machinery, equipment and land (i.e. physical savings), as well as data on the stock of existing machinery and equipment.
- Disadvantages:
  - There are no data for liquid assets, so we cannot measure financial savings directly.
  - The data quality may be an issue and there are no reliable balance sheet data.

[3] As of January 2010 there are 224 listed companies on EGX. We obtained from the Ministry of Investment data on the 50 most actively traded companies in 2008, with data going back to 2001. Hence, the sample is biased towards the large companies. Future work on this topic could explore results with a different sample.

Listed Company data:

- Advantages
  - The data come from reported balance sheets and income statements and hence are likely to be more reliable than data from firm surveys.
  - There are data on the stock of cash and hence it is possible to have an accurate measure of financial savings.
  - The panel data for 2001-2008 are available.
- Disadvantages
  - Small sample.
  - Cannot disaggregate by type of firm.
  - No data on investment (physical savings), but we can use an approximation as a change in PPE.

4.1 Construction of Variables for the ICA Data

As discussed above, the main advantage of the ICA is data on investment, which allow us to evaluate one aspect of savings – i.e. physical savings.

We create several measures of physical savings. The first measure is the proportion of firms that make any investment into property plant and equipment in any given year. Second, for firms that have made any investment we estimate the size of the investment as a portion of existing machinery and equipment. We scale total investment by the net book value for existing machinery and equipment and refer to it as investment to capital ratio, IK. For international comparison purposes and over time we also scale investment by sales.[4]

[4] Note that investment data include land and buildings purchases, and the net book value also includes land and building book values. In the data the land and buildings purchases are rare, and so they are lumped together with the machinery and equipment purchases.

Unfortunately, in the ICA surveys there are no data on liquid assets, and therefore it is not possible to construct a good proxy for financial savings.[5] However, we consider several proxies that are related to cash flows, since cash flows are related to savings as represented in the Flow of Funds Chart in Figure 2. Specifically, the ICA data allows for a calculation of operating income to sales. This is the closest measure for cash flows available in ICA data because there is no data to calculate net income or retained earnings and the total assets data are unreliable. Specifically, we construct Gross Operating income, which is defined as sales revenues minus the costs.[6] To make the comparison of firms of different sizes meaningful, GOI is scaled by firm sales, which in effect becomes a proxy for gross operating margin (GOM).

While there is no data on total retained earnings, there are questions in the survey about what proportion of investment and working capital is financed with retained earnings. These questions are used to gauge to what extent the firm has to rely on its own earnings to finance their investment and working capital.

To summarize, for ICA data we use five measures related to savings:

- Indicator for whether the firm makes any investment in a given year (called "any investment");
- Investment to capital ratio, IK;
- Operating income to sales (a proxy for cash flows);
- Proportion of retained earnings used to finance working capital;
- Proportion of retained earnings used to finance investment.

[5] The ICA data contain very few balance sheet indicators. Specifically, it contains data on total assets, total gross and net value of fixed assets (i.e. property, plant, equipment, land and buildings), and data on inventories and accounts receivables. Theoretically, it is possible to use these items to estimate the value of liquid assets as total assets minus the sum of fixed assets, accounts receivable and inventory. However, using the current ICA data this method does not produce reliable results as the resulting measure of cash stocks is often negative or unreasonably large. Therefore the balance sheet method for calculating liquid assets is deemed unreliable for ICA data for Egypt.

[6] The costs measures available in the data include purchases of raw materials and intermediate goods, cost of labor, including wages, salaries or bonuses, rent on land and buildings, rent on machinery and equipment and vehicles, and the overhead costs, including energy, transport, administrative expenses and others.

Firm Characteristics Used to Study Differences in Savings-related Measures

In addition, rich ICA data allow us a number of firm characteristics and proxies for access to finance. We use these firm characteristics to study how our five savings-related measures differ across firms. Specifically we break down our sample based on the following characteristics:

- **Firm size** (we define small as firms with fewer than 50 employees and large otherwise). About 62% of our sample is classified as small firms and only 38% are defined as medium or large.
- **Industry** (manufacturing or services).[7] About 81% of our sample is in manufacturing.
- **Foreign ownership**, firms with over 10% of equity owned by foreigners. In our sample 6.5% of firms are classified as foreign firms according to this definition.
- **Government ownership**, defined as 10% of more of the firm owned by the government. In our sample 3.2% of firms are classified as government owned. Over 90% of government owned firms are in a manufacturing industry. [8]
- **Exporter**, defined as 10% of more of the firm sales were exported directly or through a distributer. In our sample about 23% of firms are classified as exporters.

In addition, we calculate two productivity-related measures that we can use to test whether firms that are more productive also have higher cash flows or investment. We calculate **total factor productivity (TFP)** as a residual from a regression of log sales on log fixed capital and log of wages. Unfortunately this measure is only available for manufacturing firms since we don't have total value of fixed capital for service firms. In addition, we calculate **sales per employee** as a measure of labor productivity.

As discussed above, availability of external finance is an important factor that will determine savings and investment. Therefore we study how our savings-related proxies differ for

[7] Further analysis could break down firms within manufacturing industry. However within industry classifications are not consistent across different waves of the surveys, so constructing industry classification will be difficult and imprecise.

[8] We do not have a reliable indicator for female-owned firms because gender of the owner is only asked of firms with largest individual shareholder and the question also asks whether or not one of the principal owners is a female. This does not produce a sharp identification of female owned firms in our sample.

firms with different degree of availability of finance. We focus on several available measures of availability and usage of finance:

- **Savings account**, defined as a dummy for all firms that report having a savings account. In our overall sample only 24% of all firms report having a savings account. However this percentage increases over time. For example in 2003 only 14% of firms have a savings account, while in 2007 28% of all firms do. There are also large differences by firm size as large firms are much more likely to have a savings account. For example, in our sample in 2007 44% of large firms have a savings account, while only 18% of small firms do.

- **Usage of credit products**, defined as one for any firm that uses overdraft, line or credit or a loan. This measure groups together three of the commonly used credit products to isolate firms with any usage of external credit products. There are only 20% of firms in our sample that use any of these credit products, so it is not feasible to differentiate among the three products. This proportion is slightly decreasing across three waves of survey (it is 23% in 2003, 21% in 2005 and 18% in 2007 surveys). Usage of credit also significantly correlated with firm size. Only about 10 % of small firms use credit products, while over 30% of large firms do.

- **"No demand"** is an indicator variable for firms that claim they did not apply for a loan because they don't need additional capital. This variable identifies firms that have sufficient internal capital. This could happen because these firms are more productive and therefore can accumulate sufficient internal capital or because they don't plan any major investment projects in a given year, and therefore their interal funds are sufficient.

- **"Rejected"** is an indicator for firms that applied for a loan but have been rejected by the bank. This is a most clear indicator of financing constraints, since loan application can be interpreted as a revealed need for more funds, while rejection suggests that the firm was not able to obtain the funds it perceived as necessary for their business.

- **Access obstacle** is a subjective evaluation of the extent to which firms find access to finance to be a major or severe obstacle to the operation of their business. It is presented

here for comparison with more objective measures defined above. About 28% of our sample claim access to finance to be a major or severe obstacle to the operation of their business. It is also more likely to be claimed by small firms than large (30% vs. 24% for large). The access obstacle is slightly higher in 2007 9at 31%) than it was in the previous years (27% in 2003 and 25% in 2005).

Finally, as savings and investment are likely to be sensitive to firm perception of uncertainty, we consider two available subjective perceptions of uncertainty – **macroeconomic uncertainty** (such as inflation, exchange rate and others) and **regulatory policy uncertainty**. We define two indicator variables for firms that claim either of the two obstacles as a major or severe obstacle to their business. They are referred as Macro obstacle and Policy obstacle.

4.2 Construction of Variables for the Listed Firms Dataset

The first key variable of interest is financial savings, which is defined as a year to year change in the stock of cash. This definition follows Riddick and Whited (2009). For example, if the cash stock of a company has increased by 1 million relative to the previous year, we consider this increase as a new financial savings. To compare financial savings across companies of different size we scale financial savings by total assets of the previous year.[9]

The second key variable of interest is physical savings, i.e. investment in property, plant and equipment (PPE). Unfortunately we do not have a direct measure of investment in our balance sheet or income statements data because this is a supplemental data item often not required for companies to file with the exchange. To construct a proxy for investment we measured a change in gross value of PPE from year to year, scaled by the previous year value of net PPE.[10] We obtain IK (investment to capital ratio), which shows the change in gross value of PPE. This value should be highly correlated with new investment (or disinvestment if the value goes down).

In addition we calculate the ratio of stock of liquid assets (i.e. cash plus marketable securities) over total assets. This is a stock measure representing total cash (relative to assets)

[9] In other words, Financial Savings to Assets (t) = (Cash(t) – Cash(t-1))/Total assets (t-1).
[10] Physical Savings, or Investment is defined as IK (t) = (PPE(t) – PPE(t-1))/PPE(t-1).

held by companies in the sample. In essence this stock is a result of accumulation of financial savings over time.

As discussed earlier, access to external finance is an important determinant of firm's savings behavior. We use two proxies for access to external finance – the debt level and interest payments on debt.

We measure debt as sum of total debt obligations to total assets. We include short term debt, current portion of long term debt, total long term debt and bonds in our total debt measure. We use total debt of a firm as a proxy for the availability of external finance as firms with higher debt level are likely to have better access to external finance (since they were able to accumulate higher debt levels).

While companies do not report their actual interest rates, we create a proxy for interest rate measured as interest paid by firm (obtained from its income statement) over total value of its debt. This measure is an approximation to the average interest rate the firm pays on its debt obligations in a given year. Interest rate on debt is an important measure of the cost of external finance, which, as discussed, is closely tied to the incentives to save: the higher the cost of external finance, the more incentives the firms have to accumulate larger financial savings.

In addition we have several firm characteristics that are used to explain savings behavior.

Firm size. We measure firm size as log of total sales (adjusted for inflation). We use this measure to understand if savings behavior varies among firms of different sizes. In addition, size is often used as a proxy for ease of access to external finance because larger companies are often less financially constrained and can get external finance at lower costs. Even though our sample contains 36 of the largest listed companies, there is significant variation in firm size in our sample. For example, in 2008 net sales of our sample companies ranged from 17,000 LE to over 20 mil LE.

Sales volatility. We measure sales volatility as standard deviation of sales (adjusted for inflation) over our sample period (2000-2008). Volatility of sales is one of the key factors in Riddick and Whited (2009) model of savings as companies with higher volatility face more uncertainty about their future stream of income and therefore are expected to accumulate more

savings. Because we measure sales volatility using all available data for each firm and we only have 9 years of data, this measure is firm-specific (i.e. it is constant over the whole period of our sample).

Cash flows. We include cash flows to capture the cash generating capacity of the firm. In a dynamic model of Riddick and Whited (2009) cash flow is negatively correlated with cash stock because of serially correlated productivity shocks. Thus, when firms receive a good productivity shock (meaning they have good growth opportunity) their cash flow will raise. At the same time, their investment into productive equipment will also raise to allow the firm to take advantage of the higher productivity shock. As firm uses some of its stock of cash to invest into productive assets, the financial savings may fall.

We use two measures of cash flows: gross operating margin (defined as total sales, minus costs of goods sold, over total sales) and net income to assets, which is a closer proxy to the true cash flows available to firms.[11] Both measures could also proxy for profitability of the firm and thus can capture positive shocks to growth opportunities.[12]

5. Cross-Country Comparison

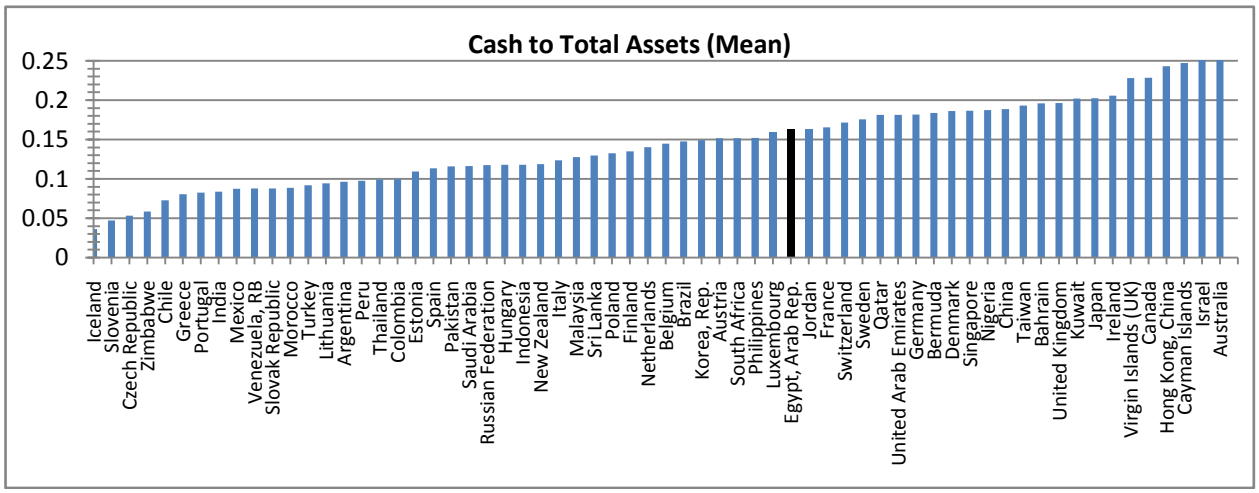
In this section we benchmark Egypt's savings into physical and financial assets with other countries for which we have the data. ICA data are available for a wide range of countries. We use data for the second wave of ICA surveys, dated 2006-2008 to compare with Egypt in 2007 We compare data on listed firms in 2007 with other listed firm data obtained from Datastream (we take pre-crisis year to eliminate the impact of the financial crisis that started in 2007 in the US and other industrial countries).

Figure 3 shows cash to assets in a cross-section of countries and Figure 4 shows financial savings to assets. Egypt falls approximately in the middle of the distribution on both measures.

[11] We use GOM as a measure for comparison with ICA data, in which this was the only cash flow measure available.
[12] As is standard in the literature, the outliers on all continuous variables were removed at the top and bottom 1% of the distribution.

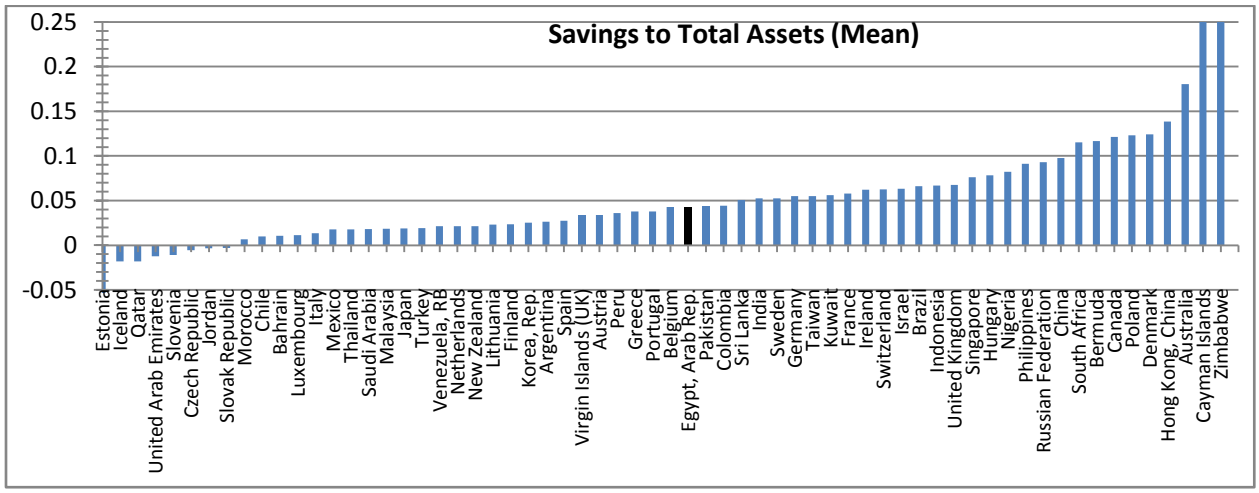
Thus, in terms of financial savings, Egypt is about average across other countries with listed company data available.

Figure 3. Cash to Assets, Listed Firms Data



Source: Datastream, staff calculations

Figure 4. Savings to Assets, Listed Firms Data

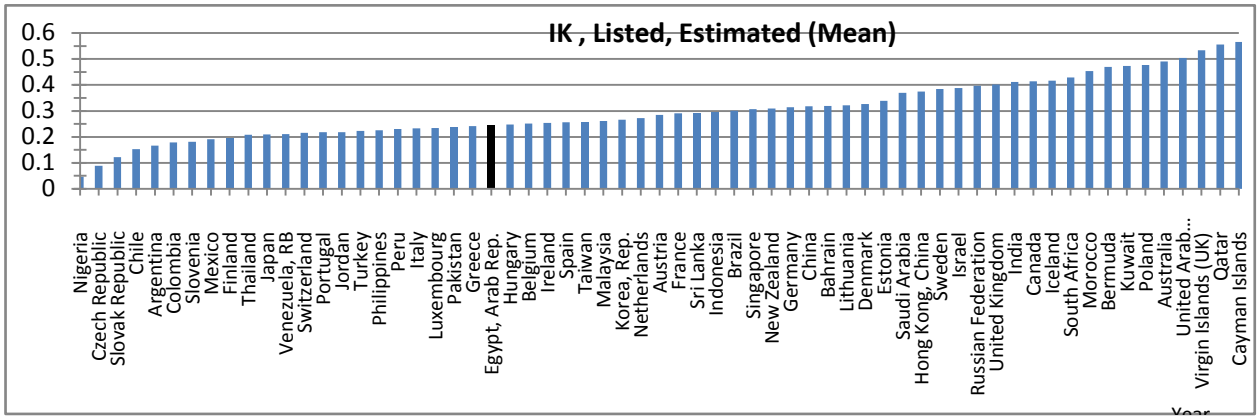


Source: Datastream, staff calculations

Figures 5 and 6 report cross-country comparison of Egypt with respect to investment measures. For listed firms data we have an approximate investment to capital ratio. We see that according to this ratio Egypt is somewhat below average in the sample. Figure 6 shows the

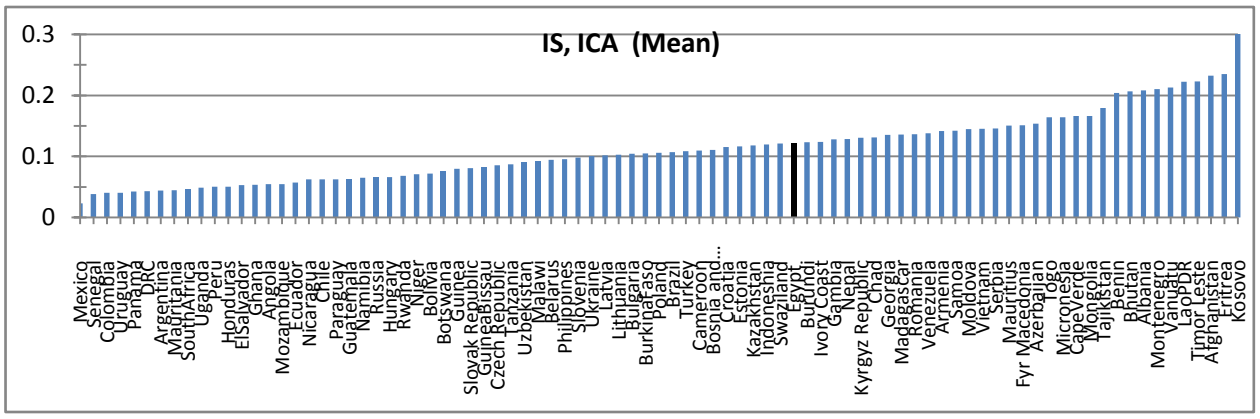
investment to sales ratio for all countries available in the second wave of ICA data.[13] According to this dataset Egypt falls slightly above average on the investment to sales measure. The likely difference is in the sample composition – the ICA data contains mainly developing countries, while the listed data contains mainly developed countries and the largest of the emerging markets.

Figure 5. Investment to Capital, Listed Firms Data



Source: Datastream, staff calculations

Figure 6. Investment to Sales, ICA Data

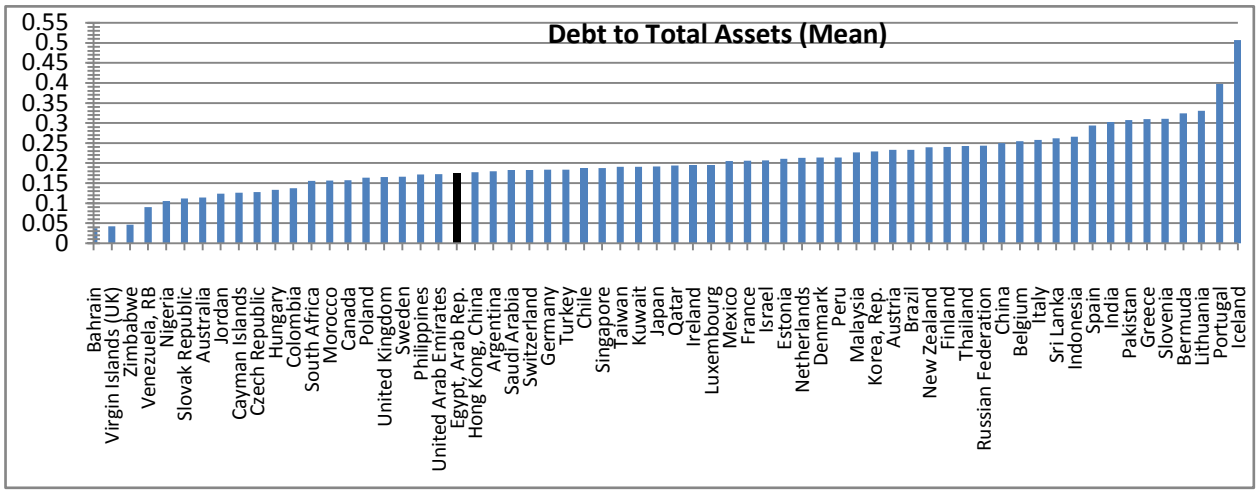


Source: Datastream, staff calculations

[13] Unfortunately there is no data on stock of PPE in the second wave of ICA data, and thus we chose to scale investment by sales.

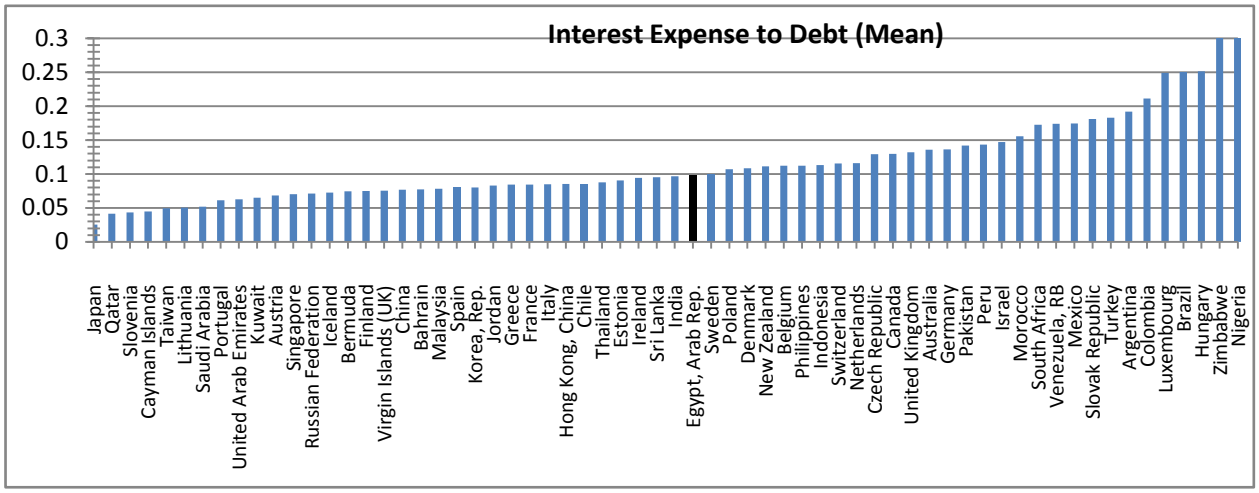
Figure 7 presents international comparison of debt rations across countries. Egypt falls below average of the international ratios. These patterns suggest that listed companies are not relying on debt as a significant source of their external finance. Figure 8 presents cross-country comparison of interest payments on debt. Egypt falls approximately in the middle of the distribution on this ratio.

Figure 7. Debt to Assets, Listed Firms Data



Source: Datastream, staff calculations

Figure 8. Interest Expense on Debt, Listed Firms data.



Source: Datastream, staff calculations

6. Descriptive Statistics of Time Trends for Savings in Egypt

6.1 ICA Data

The ICA sample contains three waves of ICA data – one collected in 2003, 2005 and 2007. Each wave allows for calculation of two consecutive years of proxies for operating income to sales, "any investment" dummy and investment to capital ratio. However the retained earnings data are only available for the year of the survey. Thus we have 6 years of data for the first three measures (specifically data for 2002-2007) and three years of data for the last two measures (specifically 2003, 2005 and 2007). Also not all data are available for service firms.[14] Table 1 presents the number of observations for each of the five variables used in the study for industries and services. Some data appear unreliable and thus we exclude the outliers to prevent influential observation from driving our results.[15]

Figure 10 shows the trends of three savings-related measures over time. The operating income to sales is slowly increasing over time, starting with about 18% in 2003 and reaching about 30% in 2007. This might indicate that the companies are becoming more profitable and have more cash flows available for investment or savings. Indeed over time a larger proportion of firms are making productive investment: "Any investment" measure is increasing from about 20% to 45% over this period. This pattern suggests that as more cash flow is available to firms they can make more investment.

The size of investment, measured as amount spent on investment relative to sales, has also increased in the past 4 years, rising from about 5% of total sales in 2004 to about 10% of total sales in 2007. However, as companies accumulate more capital, the incremental amount of new investment relative to existing fixed capital has declined (i.e., the investment to capital ratio (IK) has gone down from about 0.2 to 0.12). This is to be expected as companies mature.

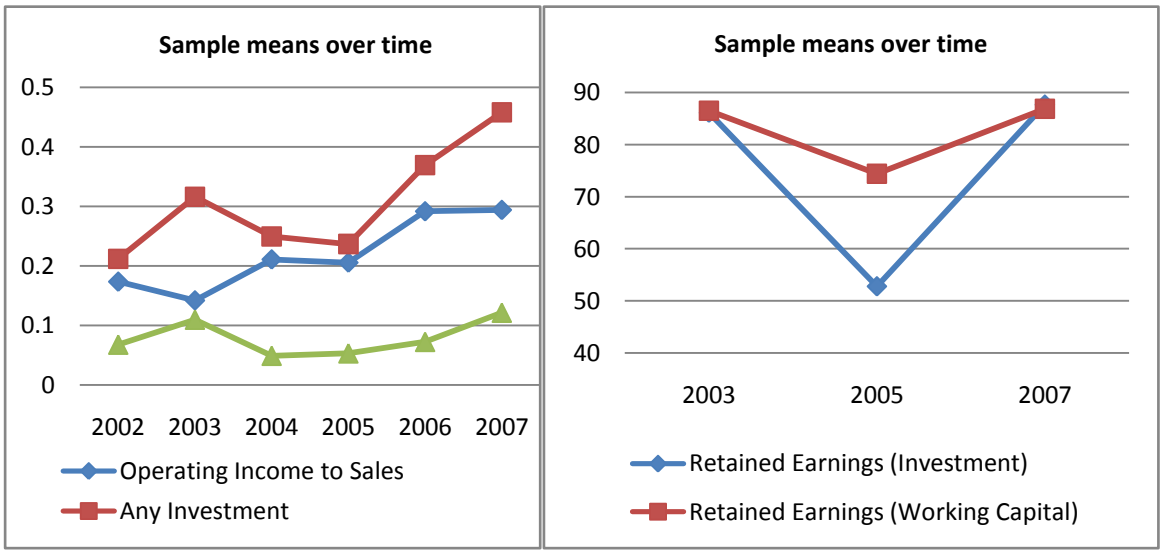
The retained earnings data are only available for 3 years in this period. The right panel of Figure 2 shows the proportions of investment and working capital financed with retained

[14] Service questionnaire does not include book value of capital and hence makes it impossible to calculate investment to capital ratio. In addition there are no service firms in the 2003 survey.

[15] Specifically we exclude any investment to capital ratio if it is bigger than 2. This means a firm has purchased 200% of the current value of machinery in one year, which is highly unlikely. We also exclude operating income to sales ratio if it is below -0.99 or above 0.99. That means if the firm's costs are less than 1% of total sales revenues or more than 99% of sales revenues, as we deem these data unreliable.

earnings. There was a temporary decline in 2005, but then these measures have increased back to about the 2003 level.

Figure 10. Sample Means of Savings-related Variables over Time



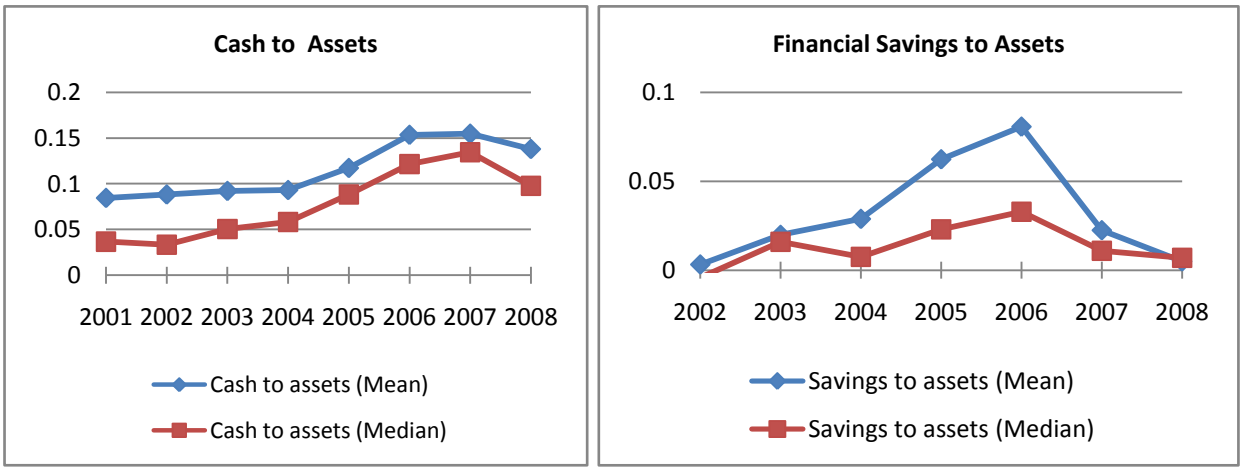
Source: ICA data.

6.2 Listed Firms Data

Figure 11 presents behavior of cash stocks to assets and financial savings over time for firms in our sample. Since 2001 cash stocks have gradually increased over the sample period from about average of 10% of total assets to average of 15% in 2007. There was a slight decline in 2008, possibly as a result of the beginning of the crisis period. The largest increase was between the years of 2005 and 2007, which corresponds to years of rapid growth in Egypt.

Financial savings are positive, which parallels increasing cash stocks. However, the magnitude of financial savings is relatively small – the average is about 5% of total assets, across all years. Financial savings are slightly increasing until 2006, with a small decline in 2007 and a larger decline in 2008.

Figure 11. Cash and Financial Savings in Egyptian Listed Firms over Time

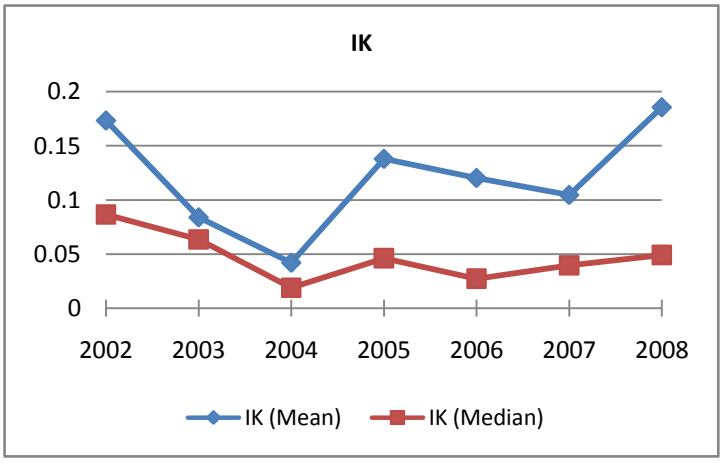


Source: EGX data, staff calculations.

The second variable of interest is investment in property, plant and equipment (PPE), which represents Physical savings. Investment is an important ingredient of company's savings policy as it measures the amount invested in additional physical assets, i.e. firm expansion.

Figure 12 presents evolution of our investment measure over time in Egypt. There is some fluctuation in this measure year to year in the mean but less fluctuation in the median. The average IK ratio is around 15%, while the median is lower, indicating that many firms chose not to make any investment in some years.

Figure 12. Investment to Capital

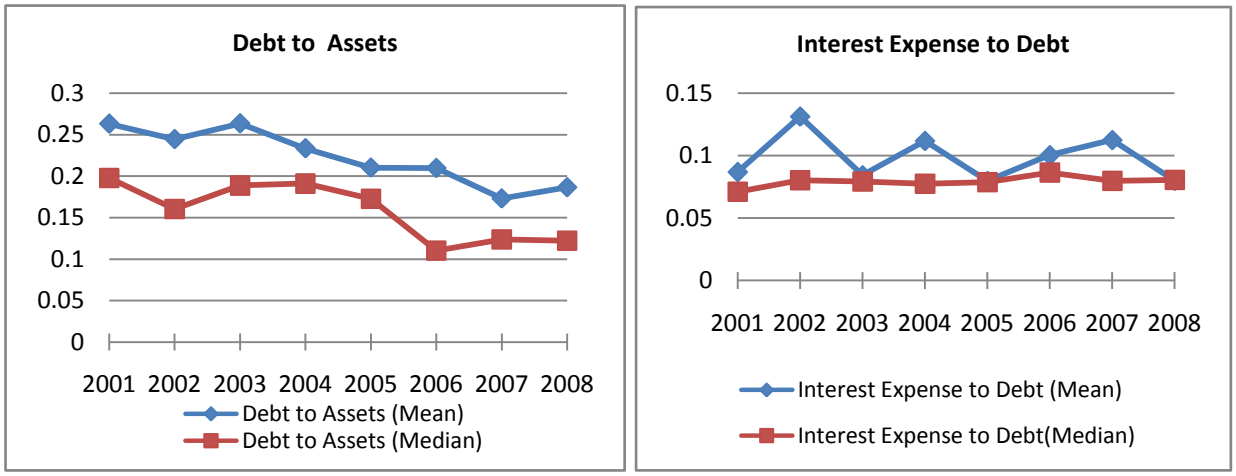


Source: EGX data, staff calculations.

Figure 13 demonstrates the time-series of debt levels in our data. We see a steadily declining trend over time, going from average of about 25% in the beginning of the sample to under 20% at the end of the sample.

In our sample the approximate average interest rate (for those firms with non-missing or nonzero observations) ranges from about 2% to 28% with an average of about 8-9%. Figure 13 shows that mean and median estimated interest rate has been rather stable in our sample period.

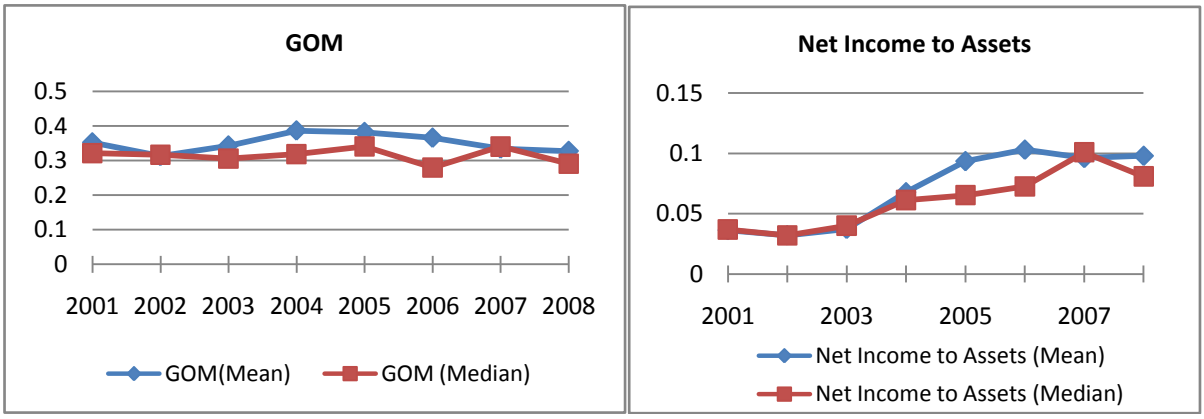
Figure 13. Debt to Assets and Interest Rate over Time



Source: EGX data, staff calculations.

Figure 14 shows evolution of two measures for cash flows over time in our sample. Gross operating margin is on average about 0.3-0.4 and is relatively stable over time. Net income is about 10% of total assets in 2008. It has been steadily increasing since the earlier part of the period, following the years of rapid growth in Egypt.

Figure 14. Gross Operating Margin and Net Income over Time



Source: EGX data, staff calculations.

7. Regression Analysis of ICA Data

Here we study how our five savings-related measures are determined by firm characteristics and access to finance using basic regression analysis. Because all the control variables are only available for the actual years of the survey, we limit our regressions to these years (i.e. 2003, 2005 and 2007). To control for macroeconomic differences across years we include time dummy variables for 2005 and 2007.

An important caveat of this analysis is that we will not be able to establish causality between our savings-related measures of interest and the factors we are using as controls, such as size, industry, and perceptions of business environment. This caveat especially applies to our investigation of the relationship between financial product usage and investment and operating income. It is plausible that firms that have more difficulties accessing external finance will not be able to make investment into productive assets. But the reverse is also possible – firms that are not planning to make investment into productive assets might be the firms with growth potential and hence unable to obtain external finance. Thus, we treat all results as suggestive of correlations between these factors and not as causal factors.

7.1 Determinants of Financial Indicators and Government Ownership

Before discussing our main variables of interest, we present a brief summary of regression results for determinants of financial variables and measures of uncertainty. Table 2 presents regressions with determinants of financial variables. We find several commonly observed

patterns. Small firms are less likely to have a savings account or to use credit products. In addition, small firms are less likely to say they have no demand for loans, meaning that they have higher unmet demand. In addition, when they apply for loans small firms are more likely to be rejected. In line with these more objective measures of financial access, small firms are more likely to be classified as constrained or claim more severe financing obstacles. However, small firms are less likely to be affected by macroeconomic uncertainty than large firms, which is not too surprising.

Foreign owned firms and exporters have more savings accounts and more use of credit products, but they are not significantly different from non-exporters in their need for funds (i.e. "no demand" variable) or in probability to be rejected. Importantly, exporters are significantly more likely to be affected by macroeconomic uncertainty and policy uncertainty than non-exporters.

Manufacturing firms are more likely to use credit products (although the regression coefficient is not significant when operating income is added to specification), but less likely to use savings accounts. Manufacturing firms are more likely to claim that they have no demand for loans and they are less likely to be rejected for loans when they apply. Manufacturing firms are more likely to be hampered by regulatory policy uncertainty than service firms.

Finally, we observe that operating income is not related to usage of credit products. Firms with higher cash flows are more likely to claim "no demand" for loans perhaps because their higher cash flows are more likely to be sufficient for their investment purposes. Firms with lower cash flows are more likely to be rejected if they apply for loans, plausibly because the banks consider their lower cash flows as a source of risk and prudently refuse the loans to these firms. It is notable that firms with higher cash flows are more likely to have savings accounts. It is plausible that firms with higher cash flows are able to have more financial savings if their investment does not proportionally match their higher cash flows. This relationship is further explored below.

We pay special attention to government owned firms because public policy plays a key role in savings in Egypt. Government owned firms are not significantly different from others in their usage of credit products, likelihood of claiming "no demand" for additional funds or

likelihood to be rejected for loans or the degree of self-reported finance obstacle. These results may suggest that government owned firms are unlikely to enjoy significant preferential access to credit. However, they have more savings accounts. Not surprisingly, government owned firms are significantly less likely to claim that macroeconomic or policy uncertainly is a major obstacle to their business.

The last column of Table 2 presents a regression with government ownership as dependent variable. Note that since most government owned firms in our sample are in manufacturing industry, the manufacturing dummy is excluded from the regression. We find that government owned firms in our sample are more likely to be large and less likely to have foreign ownership (as expected).

7.2 Determinants of Savings-related Measures

Table 3, Panel A presents basic regressions of our five savings-related measures and firm-level determinants.[16] Operating income to sales is used as dependent variable in model 1, as well as one of the controls in other models to evaluate if cash flow affects the likelihood of investment, size of investment or the proportion of investment financed with retained earnings.

We find that small firms are less likely to invest in machinery and equipment than large firms and when they do they tend to invest smaller amounts. Small firms also have larger cash flow relative to sales. Small firms are also more likely to use retained earnings for working capital (plausibly because of their lack of access to external funds). As observed above, small firms are less likely to have savings accounts and less access to credit products. These results are consistent with commonly observed patterns that find small firms are more disadvantaged relative to large in their access to external finance and hence their ability to make investment.

Foreign owned firms are not significantly different from other firms in their cash flows and they are more likely to make investments into fixed assets. However the amount of investment is not significantly different from other firms (even though the coefficients are

[16] Regression for operating income to sales is estimated with OLS since it is a continuous variable, limited between –0.99 and 0.99; regression with any investment is estimated by probit, since any investment is an indicator variable. Regression with IK is estimated by Tobit since it is limited between zero and 2, and regressions with retained earnings are estimated by Tobit with limits between 0 and 100% since these variables measure what percent of total working capital or investment finance came from retained earnings.

positive) and they use less retained earnings for working capital (presumably because they have better access to credit products as shown above).

Exporters are more likely to make investment and when they do they invest larger amounts. It is plausible that their higher investment is dictated by their need to stay competitive on international markets. Exporters are less likely to use retained earnings for working capital, likely because of higher usage of credit products. However, when usage of credit products is controlled for, the exporters use higher proportion of retained earnings for investment (not reported).

Government owned firms do not have significantly different cash flows than other firms, which does not support the common notion that government owned firms are less profitable.[17] They are not significantly different from other firms in their investment behavior, and they use less retained earnings to finance investment.

Higher cash flows proxied by operating income to sales are unrelated to the incidence of investment or the size of investment. However, firms with higher cash flows are more likely to use retained earnings to finance working capital, perhaps because it is less expensive to use internally generated funds than external funds.

Manufacturing firms have significantly lower cash flows (and the magnitude of the difference is very large) and they are significantly less likely to make any investment than service firms. These results could indicate that manufacturing firms lack profitable growth opportunities, or perhaps that their costs of operation are relatively high. They also use more retained earnings to finance their working capital.

The patterns over time parallel those observed earlier. The operating income to sales was higher in 2007 than it was in 2003 and 2005, consistent with positive trend observed in Figure 2. Investment was lower in 2005 than it was in 2003, but recovered to the previous level in 2007.

In Panel B we add our measure of TFP to the set of regressions discussed above. We find positive and significant effects – i.e. firms that have higher TFP are more likely to make

[17] Our measure of operating income to sales is only indirectly related to firm profitability. More commonly used measures of profitability are ROA (return on assets) or ROE (return on equity), which are not available in ICA data.

investment and when they invest they do so with larger amount of investment. Firms with higher TFP also have higher cash flows, they are less likely to use retained earnings to finance working capital or investment. In additional regressions (not reported) we substitute TFP with our measure of labor productivity (sales to employees) and obtain very similar results.[18]

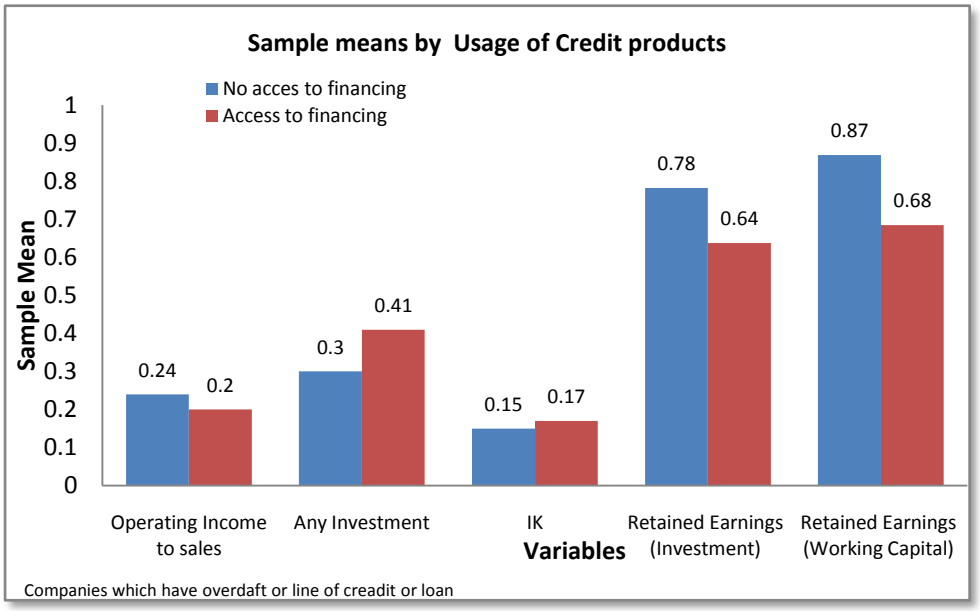
7.3 Financial Indicators and Savings-related Measures

Next, we explore the influence of financial variables on the outcome variables discussed so far. To our basic regressions presented in Table 3 we add five of our financial variables - usage of credit products, indicator for "no demand" for capital, indicator for rejected firms, indicator for firms that have a savings account and the subjective finance obstacle. We add each of these indicators one at a time to each of the regressions presented in Table 3. Finally, we add two other subjective measures of obstacles for the macroeconomic and political uncertainty. The summary of these results is presented in Table 4. Although we run all these as separate regressions for ease of reference we present only the summary of results for these new variables added to the basic regression. Thus, each cell in Table 4 represents a single regression. Most of the results discussed above do not change with additional variables added.

We find that usage of credit products is significantly related to firm investment behavior. Firms that use credit products are more likely to make any investment and more likely to invest larger amounts. They are also less likely to use retained earnings for working capital or investment. While the results obtained from regression are more reliable (because the interdependencies between the variables are taken into account), these results on usage of financial products also hold in the raw data. Figure 15 demonstrates that firms with credit products are more likely to make investment, make larger investment relative to existing capital and use less retained earnings for working capital and investment.

[18] Since our results are based on cross-sectional regression, we cannot establish causality. In other words, firms that make more investment are more likely to be more productive.

Figure 15. Sample Means by Usage of Credit Products



Source: ICA data

The usage of credit products is not significantly related to our proxy for cash flow, but, as shown above, it clearly is an important determinant of investment. While our results cannot be interpreted in a casual manner, they are suggestive of the positive impact increased usage of financial products might have on stimulating investment into productive assets. While we cannot test for this directly, these results are also consistent with a possibility that firms without access to external finance will need to accumulate financial savings before they can make investment.

Firms that claim they have no demand for loans have higher cash flows. This may explain why these firms claim that they have no demand – their cash flows are adequate for their financing needs. They do not make any more investment relative to firms that have demand for more loans.

Firms that applied and were rejected for loans have lower cash flows. This might be a reason for the loan rejection. Surprisingly, these firms also have higher investment than other firms, perhaps suggesting that they have strong investment opportunities and that is why they have applied for a loan.

As we observed before, firms that have savings accounts have higher cash flows. The causality is likely to run the opposite direction – i.e. firms with higher cash flows are more likely to have savings accounts. Firms with savings accounts are not more likely to make investment than firms without savings account.

Firms that claim higher financing obstacles actually make more investments and invest larger amounts. This is most easily explained by reverse causality – firms with good investment projects are more likely need external finance and hence claim finance is an obstacle. When actual usage of credit products and finance obstacles are included together, we find that usage of credit products continues to be strongly significant, while financing obstacles measure loses some of its significance. The results suggest a stronger relationship of actual usage of credit products with investment.

Finally, we investigate whether two proxies for uncertainty – macroeconomic and policy uncertainty are related to cash flows or investment behavior. We find that macroeconomic uncertainty decreases the likelihood of investment, but has no effect on the amount of investment. Policy uncertainty does not have a significant relationship to our variables of interest.

8. Regression Analysis of Listed Firms Data

8.1 Financial Savings and Cash Stocks

We report results of regression of our three key dependent variables – financial savings, cash stocks and investment to capital ratios - on the set of explanatory variables discussed above. To mitigate simultaneity in firm decisions we lag all explanatory variables one year. Previous year values may be considered predetermined when the firm chooses its savings policy in the current year. We include time dummies to control for aggregate macroeconomic patterns. We estimate the model by OLS with firm clustered standard errors.[19]

[19] Because one of our key explanatory variables is not time-varying – volatility of sales – we do not estimate the model with fixed effects.

Table 5 reports results for financial savings and Table 6 reports similar results for cash stocks. We observe that larger firms are making more financial savings, but the result is not significant at conventional levels.

Firms that exhibit more volatility (measured as standard deviation of sales over the past 8 years) are accumulating more financial savings and also hold larger stocks of cash as precautionary balances. This result is in line with the theoretical arguments discussed above, that suggest that firms that have more uncertainly about their future cash flows save more. This result may also suggest that firms in our sample perceive difficulties with raising external funds: If external finance was easily available, the firms would not need to hold larger stocks of internal funds.

With respect to debt levels, we don't find any significant relationship between debt and financial savings, but there is a negative relationship between debt and cash stocks. Firms with higher debt levels have lower cash stock. This could be because firms with more debt experience easier access to external finance (because they were able to raise more debt) and therefore do not need to hold as much cash as a precautionary balance as their counterparts with less debt. In addition, it is inefficient to hold larger cash stocks and larger debt levels because the different in interest rate that can be earned on the cash holdings is much lower than the interest rate paid on debt. Therefore it makes sense for the company to exhaust its own cash stocks first before taking n additional debt levels.

The most pronounced effect on financial savings is observed for our estimated interest rate measure. Firms that were paying higher interest rate on debt in the previous year are making more financial savings. The coefficient on interest rate remains significant even when we add all other controls simultaneously (not reported). This regression also produces the largest R squared coefficient on financial savings (close to 0.15). We also find that firms in higher interest rate brackets are holding higher stocks of cash.

These results confirm that the availability and costs of external finance are a key determinant of financial savings behavior in our sample firms. Firms that have to pay higher interest rates on their debt obligations are more motivated to save themselves so they do not have

to rely so much on external finance. These results again point to limitations in external finance access in Egypt, even for this very selective sample of largest listed firms.

We find little or no effect of cash flows or net income on financial savings, while there is a clear positive relationship between net income and cash stocks (firms with higher cash flows are able to hold more cash).

8.2 Determinants of Investment

In Table 7 we report similar regressions for investment to capital ratios. We find that larger firms make more investment into physical assets. This result parallels what we found earlier in the ICA data. Firm size is a dominant determinant of investment in our data as the regression with firm size produces much larger R squared.

We also find that sales growth is positively related to investment as sales growth is one proxy for good growth opportunities. It is expected that firms with good growth opportunities will make more investment. However, if we include firm size in this regression, sales growth becomes not significant (the p-value becomes close to 15%, which could be considered marginally significant).

The interest rate and net income both are positive and marginally significant (at about 15%). We do not find any other significant determinants of investment in our data.

Finally, we investigate how physical savings are related to financial savings over time. As discussed above, total savings can be allocated either toward physical savings or financial savings. Therefore, the contemporaneous relationship between financial savings and physical savings is likely to be negative – i.e. if firm spends money on new machinery, there is less money to save as financial assets. There is likely to be a decrease in cash stocks as well, since investment into PPE uses up liquid assets that firm has accumulated.

However, one of the key reasons firms accumulate financial savings is to invest in physical assets in the future. Therefore, overtime we should find that an increase in financial savings in one year is likely to lead to increase in physical savings (i.e. investment) in the future.

Table 8 presents a simple dynamic model of investment. Here investment is regressed on lagged financial savings and cash stocks. We find that one year lags of financial savings have negative impact on investment. However, the second lag is positive. This is true for both savings and cash stocks. These results suggest that it takes about 2 years for firms between the time they increase their financial savings and the time they undertake new investment. The first year after the firms increase financial savings and cash stocks they are less likely to invest. This confirms that firms are accumulating their internal savings before they can undertake new investment. This finding indirectly suggests that external finance is limited or too costly for these firms and hence they prefer to accumulate their own internal funds before undertaking new investment.

9. Summary and Conclusions

This paper investigated measures related to the corporate savings and investment behavior of firms in Egypt using two different datasets of firm level information. Both datasets have advantages and disadvantages described in the text. Despite the limitations, this is a first step in studying saving and investment behavior in Egypt using data at the microeconomic level. The main findings are summarized below.

Egypt falls in the middle of the cross-country distribution of financial savings and physical savings (i.e. investment), but below average on debt levels.

Main results of the ICA approach:

a) The usage of financial products is associated with increased incidence and amount of investment.

b) Small firms are more constrained in access to finance and they invest less in fixed assets (i.e. less physical savings) and use more retained earnings to finance their investment.

c) TFP is associated with more investment and larger cash flows.

d) Exporting firms use more external finance and invest more (plausibly to stay more competitive).

Main results of the listed companies exercise:

a) Large firms make more physical savings (i.e. investment into fixed assets);

b) More volatility of sales is associated with higher financial savings;

c) Higher cost of capital is associated with higher financial savings;

d) Increase in financial savings leads to increase in physical savings (i.e. investment) in about 2 years.

Despite the data limitations, two important findings are consistent across the two very different datasets. The fact that these findings are consistent in both datasets reaffirms the usefulness and credibility of these results.

First is the finding that larger firms invest more (physical saving), which is essential for maintaining competitiveness and growth. The study points out that one important reason small firms invest less is lack of access to credit. Thus, improving access to credit for small and medium enterprises is likely to have a positive impact on investment.

Second, despite the financial deepening, the use of credit products has been declining during the last decade. This result is observed in both datasets. Specifically, usage of credit products in ICA data has declined from 23% in 2003, to 21% in 2005 and 18% in 2007 surveys. Among the listed firms, the debt levels relative to assets have declined from about 25% average (20% median) in 2001 to below 20% average (and below 15% median) in 2008. This trend raises concern and more research is needed to understand the reasons for such "deleveraging." The reasons could be supply-side constraints, with banks unwillingness to lend at rates attractive to corporate sector or crowding out by the government sector, or demand-side weaknesses, such as lack of productive growth opportunities. Our data do not allow such analysis.

Large literature has established a solid link between access to finance, productive investment and growth on the macro and micro levels. The results of this study confirm that firms in Egypt, especially small and medium firms, would benefit from increased access to finance which is likely to support firm investment into productive assets (i.e. physical savings) and stimulate growth.

Based on this analysis, the main policy recommendation from the study reaffirms the importance of improving access to financial services in Egypt. It is recommended to undertake further studies on constraints to financial access and include data on financial savings in future

ICA surveys. In addition, policies aimed at reducing macroeconomic volatility are likely to result in increased investment.

Table 1. Number of observations for savings related measures, ICA data

Year	Operating Income to sales	Any Investment	IK	Retained Earnings (Investment)	Retained Earnings (Working Capital)
	Manufacturing				
2002	691	977	168	0	0
2003	875	977	273	716	977
2004	918	996	309	0	0
2005	873	996	198	995	995
2006	1002	1156	362	0	0
2007	1019	1156	458	1154	1152
Total	**5378**	**6258**	**1768**	**2865**	**3124**
	Services				
2004	223	0	0	0	0
2005	224	343	0	343	343
2006	335	374	0	0	0
2007	250	374	0	372	372
Total	**1032**	**1434**	**0**	**715**	**715**

Table 2. Determinants of Financial Indicators and Government Ownership, ICA data

	1	2	3	4	5	6	7	8
Dependent variables	Usage of Credit Products	No Demand	Rejected	Savings Account	Finance Obstacle	Macro Obstacle	Policy Obstacle	Government
Small size	-0.20***	-0.06***	0.03***	-0.20***	0.06***	-0.08***	0.00	-0.06***
	(0.000)	(0.005)	(0.000)	(0.000)	(0.005)	(0.000)	(0.973)	(0.000)
Foreign	0.09***	0.04	-0.01	0.10***	-0.06	-0.03	0.01	-0.01***
	(0.002)	(0.222)	(0.274)	(0.001)	(0.153)	(0.327)	(0.891)	(0.003)
Exporter	0.10***	-0.01	0.01	0.14***	-0.01	0.08***	0.04**	0.00
	(0.000)	(0.757)	(0.555)	(0.000)	(0.838)	(0.000)	(0.050)	(0.267)
Manufacturing	0.03	0.07***	-0.43***	-0.12***	0.01	-0.02	0.08***	
	(0.226)	(0.004)	(0.000)	(0.000)	(0.673)	(0.401)	(0.008)	
Government	0.01	0.05	-0.00	0.18***	-0.08	-0.19***	-0.23***	
	(0.709)	(0.298)	(0.822)	(0.000)	(0.157)	(0.000)	(0.000)	
Operating Income to Sales	-0.01	0.05*	-0.02**	0.06***	-0.02	0.00	-0.03	-0.01
	(0.801)	(0.080)	(0.022)	(0.006)	(0.416)	(0.929)	(0.244)	(0.147)
Year 2005	-0.05***	-0.05**	0.03***	0.05**	0.02	-0.06***	-0.01	0.01**
	(0.004)	(0.023)	(0.000)	(0.022)	(0.465)	(0.005)	(0.535)	(0.020)
Year 2007	-0.07***	0.10***	-0.07***	0.11***	0.06**	0.04*	-0.12***	0.00
	(0.000)	(0.000)	(0.000)	(0.000)	(0.012)	(0.063)	(0.000)	(0.312)
Observations	3237	3237	3237	3222	2195	3197	3199	3237

Note: all regressions estimated by Probit.

Table 3. Panel A. Basic Regressions with Savings-Related Measures, ICA data

Dependent variable	(1) Operating Income to Sales	(2) Any Investment	(3) Any Investment	(4) IK	(5) IK	(6) Ret. Earnings WK	(7) Ret. Earnings WK	(8) Ret. Earnings Invest	(9) Ret. Earnings Invest
Small size	-0.02	-0.14***	-0.13***	-0.09***	-0.08***	14.62**	15.24**	-7.44	-18.48
	(0.121)	(0.000)	(0.000)	(0.000)	(0.000)	(0.024)	(0.022)	(0.697)	(0.364)
Foreign	0.02	0.09**	0.08**	0.05	0.04	-36.59***	-36.54***	-23.98	-58.71*
	(0.530)	(0.014)	(0.040)	(0.117)	(0.218)	(0.000)	(0.001)	(0.466)	(0.094)
Exporter	-0.01	0.09***	0.11***	0.09***	0.09***	-20.78***	-18.22**	10.30	16.07
	(0.578)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.013)	(0.628)	(0.474)
Manufacturing	-0.35***	-0.28***	-0.28***			61.91***	66.26***	-26.76	-37.04
	(0.000)	(0.000)	(0.000)			(0.000)	(0.000)	(0.225)	(0.175)
Government	-0.06	-0.02	-0.02	-0.02	-0.02	-22.13	-21.13	-84.03*	-108.92**
	(0.179)	(0.699)	(0.727)	(0.680)	(0.618)	(0.183)	(0.233)	(0.083)	(0.038)
Year 2005	-0.01	-0.19***	-0.20***	-0.18***	-0.18***	-30.64***	-27.57***	-358.75***	-350.18***
	(0.520)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year 2007	0.08***	0.03	0.03	-0.00	0.00	23.61***	15.22**	31.79	14.44
	(0.000)	(0.179)	(0.139)	(0.973)	(0.982)	(0.002)	(0.047)	(0.161)	(0.546)
Operating Income to Sales			-0.04		0.01		18.32**		18.65
			(0.123)		(0.718)		(0.036)		(0.484)
Constant	0.51***			-0.15***	-0.14***	132.27***	120.66***	461.95***	476.17***
	(0.000)			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	3237	3609	3153	2885	2600	3833	3237	3573	3012
R-squared	0.147								

Note: regression one is estimated by OLS, 2 and 3 by Probit and all others by Tobit.

Table 3. Panel B. Regressions with Savings Related Measures and TFP, ICA data

Dependent variable	(1) Operating Income to Sales	(2) Any Investment	(3) Any Investment	(4) IK	(5) IK	(6) Ret. Earnings WK	(7) Ret. Earnings WK	(8) Ret. Earnings Invest	(9) Ret. Earnings Invest
Small size	0.03**	-0.13***	-0.12***	-0.07***	-0.07***	21.69***	20.36***	-37.34**	-40.70**
	(0.025)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.049)	(0.040)
Foreign	-0.00	0.03	0.02	0.03	0.02	-21.19**	-20.55*	-54.63*	-73.18**
	(0.864)	(0.408)	(0.577)	(0.356)	(0.500)	(0.034)	(0.054)	(0.098)	(0.035)
Exporter	-0.03**	0.11***	0.11***	0.09***	0.09***	-6.17	-1.72	-3.09	5.30
	(0.019)	(0.000)	(0.000)	(0.000)	(0.000)	(0.323)	(0.790)	(0.881)	(0.806)
Government	-0.09**	-0.04	-0.04	-0.03	-0.03	-30.19**	-23.52	-107.53**	-101.55**
	(0.043)	(0.363)	(0.470)	(0.474)	(0.423)	(0.039)	(0.123)	(0.018)	(0.037)
TFP	0.11***	0.04***	0.04***	0.04***	0.04***	-5.98**	-10.04***	-0.51	-1.63
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.011)	(0.000)	(0.946)	(0.853)
Year 2005	0.03*	-0.18***	-0.19***	-0.17***	-0.17***	-5.31	-6.75	-311.01***	-304.94***
	(0.057)	(0.000)	(0.000)	(0.000)	(0.000)	(0.406)	(0.312)	(0.000)	(0.000)
Year 2007	0.05***	0.04*	0.04*	-0.00	-0.00	4.02	0.24	-0.64	-3.52
	(0.000)	(0.068)	(0.086)	(0.944)	(0.948)	(0.515)	(0.970)	(0.976)	(0.872)
Operating Income to Sales			-0.03		-0.03		18.94**		26.73
			(0.294)		(0.379)		(0.033)		(0.353)
Constant	0.12***			-0.14***	-0.14***	160.03***	159.09***	419.13***	414.72***
	(0.000)			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	2673	2816	2598	2766	2563	2898	2673	2670	2464
R-squared	0.134								

Table 4. Summary of regressions adding one indicator at a time, ICA data

Dependent variable	(1) Operating Income to Sales	(2) Any Investment	(3) Any Investment	(4) IK	(5) IK	(6) Ret. Earnings WK	(7) Ret. Earnings WK	(8) Ret. Earnings Invest	(9) Ret. Earnings Invest
Usage of Credit Products	-0.01	0.09***	0.10***	0.09***	0.10***	-101.41***	-97.03***	-193.82***	-195.94***
	(0.684)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
No Demand	0.04***	-0.00	-0.00	0.00	-0.01	49.53***	48.54***	6.94	6.69
	(0.001)	(0.862)	(0.891)	(0.983)	(0.772)	(0.000)	(0.000)	(0.793)	(0.813)
Rejected	-0.11***	0.09***	0.07*	0.08*	0.09*	-76.96***	-87.44***	-10.95	-60.59*
	(0.000)	(0.010)	(0.059)	(0.095)	(0.061)	(0.000)	(0.000)	(0.733)	(0.090)
Savings Account	0.04***	0.01	0.01	0.04	0.04	9.79	8.38	36.65*	34.60
	(0.007)	(0.714)	(0.758)	(0.103)	(0.118)	(0.158)	(0.251)	(0.075)	(0.114)
Financing Obstacles	-0.01	0.03	0.05*	0.03	0.05*	-23.73***	-27.85***	-78.42***	-70.69***
	(0.413)	(0.267)	(0.051)	(0.193)	(0.066)	(0.000)	(0.000)	(0.000)	(0.000)
Macro Obstacle	0.00	-0.04*	-0.03*	-0.00	0.01	1.15	-2.17	-35.59*	-24.56
	(0.953)	(0.065)	(0.091)	(0.978)	(0.696)	(0.858)	(0.744)	(0.055)	(0.216)
Policy Obstacle	-0.01	-0.01	-0.00	-0.03	-0.02	2.92	1.74	14.89	20.17
	(0.238)	(0.508)	(0.853)	(0.129)	(0.364)	(0.614)	(0.771)	(0.373)	(0.262)

Notes: Regressions 3, 5, 7 and 9 add operating income to sales as one of the controls, while others do not.

Table 5. Savings regressions, Listed Firms data

LABELS	1	2	3	4	5	6
Log of net sales	0.001					
	(0.156)					
Volatility of Sales		0.10***				
		(0.005)				
Total Debt to Assets			-0.01			
			(0.789)			
Interest Rate				0.24***		
				(0.000)		
Gross Margin					-0.01	
					(0.748)	
Net Income						0.08
						(0.324)
year==2002	0.05	0.09*	0.07	0.07	0.05	0.05
	(0.304)	(0.088)	(0.103)	(0.277)	(0.342)	(0.302)
year==2003	0.06	0.10*	0.09*	0.07	0.05	0.06
	(0.210)	(0.055)	(0.051)	(0.209)	(0.268)	(0.212)
year==2004	0.06	0.11**	0.10**	0.10*	0.06	0.06
	(0.174)	(0.030)	(0.025)	(0.070)	(0.176)	(0.151)
year==2005	0.11*	0.15**	0.13**	0.12*	0.10*	0.10*
	(0.060)	(0.017)	(0.013)	(0.095)	(0.063)	(0.066)
year==2006	0.12*	0.17**	0.15**	0.15*	0.13*	0.12*
	(0.062)	(0.018)	(0.012)	(0.081)	(0.058)	(0.067)
year==2007	0.06	0.11**	0.09*	0.10*	0.05	0.05
	(0.171)	(0.042)	(0.059)	(0.064)	(0.259)	(0.214)
year==2008	0.04	0.08	0.08	0.07	0.05	0.04
	(0.355)	(0.117)	(0.104)	(0.229)	(0.293)	(0.418)
Constant	-0.08	-0.13**	-0.07	-0.09	-0.04	-0.05
	(0.107)	(0.028)	(0.108)	(0.124)	(0.440)	(0.278)
	222	224	231	206	218	220
	0.070	0.133	0.073	0.127	0.067	0.069

Table 6. Cash Stock Regressions, Listed Firms data

LABELS	1	2	3	4	5	6
Log of net sales	-0.00					
	(0.822)					
Volatility of Sales		0.06				
		(0.202)				
Total Debt to Assets			-0.17***			
			(0.003)			
Interest Rate				0.19**		
				(0.012)		
Gross Margin					0.04	
					(0.557)	
Net Income						0.49***
						(0.005)
year==2002	-0.03**	-0.02	-0.00	-0.01	-0.01	-0.01
	(0.033)	(0.214)	(0.904)	(0.808)	(0.779)	(0.804)
year==2003	-0.03*	-0.02	-0.00	-0.01	-0.01	-0.01
	(0.067)	(0.424)	(0.958)	(0.878)	(0.714)	(0.736)
year==2004	-0.02	-0.02	0.00	-0.00	-0.01	-0.02
	(0.252)	(0.450)	(0.895)	(0.949)	(0.698)	(0.568)
year==2005	0.01	0.01	0.03	0.03	0.02	0.01
	(0.644)	(0.615)	(0.483)	(0.622)	(0.586)	(0.816)
year==2006	0.05*	0.05	0.05	0.07	0.06	0.03
	(0.088)	(0.121)	(0.191)	(0.277)	(0.210)	(0.477)
year==2007	0.05*	0.05	0.06	0.07	0.05	0.02
	(0.085)	(0.104)	(0.162)	(0.200)	(0.197)	(0.533)
year==2008	0.03	0.03	0.03	0.05	0.05	0.00
	(0.321)	(0.406)	(0.383)	(0.313)	(0.259)	(0.932)
Constant	0.12*	0.08**	0.14***	0.07	0.08**	0.08***
	(0.060)	(0.017)	(0.000)	(0.192)	(0.019)	(0.008)
	253	260	232	206	217	219
	0.079	0.077	0.143	0.132	0.075	0.176

Table 7. Investment to Capital Regressions, Listed Firms data

	(1) IK	(2) IK	(3) IK	(4) IK	(5) IK	(6) IK	(7) IK
Log of net sales	0.04***						
	(0.001)						
Volatility of Sales		0.02					
		(0.813)					
Sales Growth			0.17*				
			(0.075)				
Total Debt to Assets				0.06			
				(0.672)			
Interest Rate					0.21		
					(0.141)		
Gross Margin						-0.01	
						(0.930)	
Net Income							0.44
							(0.152)
year==2002	-0.13	-0.09	-0.21***	-0.16**	-0.13	-0.17**	-0.16*
	(0.143)	(0.262)	(0.006)	(0.044)	(0.225)	(0.036)	(0.059)
year==2003	-0.16**	-0.21**	-0.21***	-0.22***	-0.16**	-0.19***	-0.17**
	(0.039)	(0.022)	(0.001)	(0.006)	(0.038)	(0.008)	(0.016)
year==2004	-0.20**	-0.25**	-0.22***	-0.27***	-0.14	-0.19**	-0.18**
	(0.019)	(0.020)	(0.003)	(0.008)	(0.126)	(0.026)	(0.029)
year==2005	-0.18**	-0.15**	-0.17***	-0.17**	-0.16*	-0.15**	-0.16**
	(0.018)	(0.034)	(0.009)	(0.018)	(0.057)	(0.030)	(0.030)
year==2006	-0.20***	-0.17**	-0.20***	-0.17**	-0.15	-0.18**	-0.19**
	(0.009)	(0.035)	(0.007)	(0.041)	(0.113)	(0.018)	(0.016)
year==2007	-0.21***	-0.17**	-0.22***	-0.20**	-0.19*	-0.18**	-0.18**
	(0.009)	(0.031)	(0.006)	(0.028)	(0.061)	(0.026)	(0.035)
year==2008	-0.12	-0.09	-0.15	-0.12	-0.09	-0.12	-0.15
	(0.186)	(0.323)	(0.104)	(0.239)	(0.404)	(0.200)	(0.123)
Constant	-0.06	0.27***	0.29***	0.29***	0.24***	0.29***	0.26***
	(0.645)	(0.001)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)
Observations	221	226	215	231	204	215	217
R-squared	0.142	0.039	0.090	0.038	0.043	0.031	0.049

Table 8. Dynamic relationship between Investment and Financial Savings, Listed Firms data

	1 IK	2 IK	3 IK	4 IK	5 IK	6 IK
Cash stock (t-1)	-0.31				-0.99*	
	(0.500)				(0.087)	
Cash stock (t-2)		0.22			0.87**	
		(0.339)			(0.026)	
Financial Savings (t-1)			-0.20**			-0.23**
			(0.034)			(0.048)
Financial Savings (t-2)				0.41***		0.34**
				(0.007)		(0.048)
year==2002	-0.22**					
	(0.020)					
year==2003	-0.25**		-0.04			
	(0.025)		(0.654)			
year==2004	-0.29**	-0.08	-0.11	-0.07	-0.06	-0.06
	(0.019)	(0.316)	(0.356)	(0.270)	(0.374)	(0.341)
year==2005	-0.19**	0.02	-0.01	-0.06	0.04	-0.04
	(0.018)	(0.566)	(0.931)	(0.306)	(0.297)	(0.430)
year==2006	-0.23***	0.02	-0.03	-0.07	0.03	-0.07
	(0.007)	(0.675)	(0.723)	(0.262)	(0.373)	(0.265)
year==2007	-0.21**	-0.06	-0.07	-0.12*	0.01	-0.09
	(0.019)	(0.240)	(0.461)	(0.078)	(0.842)	(0.176)
year==2008	-0.13	0.06	0.04	-0.07	0.10	-0.06
	(0.180)	(0.261)	(0.635)	(0.363)	(0.132)	(0.432)
Constant	0.36***	0.10***	0.15*	0.19***	0.11***	0.18***
	(0.001)	(0.001)	(0.090)	(0.003)	(0.004)	(0.003)
Observations	228	191	192	155	188	154
R-squared	0.053	0.036	0.038	0.059	0.100	0.057